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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,429	09/24/2004	Ludovic Noirie	Q82799	3427

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EXAMINER	
STAHL, MICHAEL J	

ART UNIT	PAPER NUMBER
2874	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/509,429	NOIRIE ET AL.	
	Examiner	Art Unit	
	Mike Stahl	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 10-12* is/are rejected.

7)☒ Claim(s) *4-9 and 13-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Objections

Claims 4-6 are objected to because in line 2 the extra "switching" immediately following "space switching" should be deleted.

Claim 16 is objected to because it is conflict with parent claim 1. Claim 16 recites that the number of dividers is less than N. However, claim 1 establishes that there are N dividers in line 5 ("each of said N dividers") and lines 11-12 ("each of said N outputs comes from a different divider" implies that there are N dividers).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiragaki et al. (US 6115517).

Claim 1: Shiragaki discloses in fig. 5 a space cross-connect unit (SCCU) with N input ports and P output ports, comprising: a broadcast stage with N signal dividers **511-51n** each having one input and C outputs where C is an integer factor of P less than P, each input being connected to one of the N input ports **501-50n** so that each divider divides a signal received at one of the input ports into C signals at the C outputs, and a space switching stage comprising at

most C space switching modules (a single module is regarded as including the set of elements **52i-j** and **53i-j** which are ultimately connected to a common multiplexer **56i** in fig. 5), the SCCU being characterized in that: the C space switching modules are non-blocking and non-broadcasting, and each module has N inputs and P/C outputs, said N inputs are connected to N outputs of the broadcast stage, each of those N outputs comes from a different divider **51i**, and each of the P/C outputs of the modules is connected to a respective one of the P output ports. In terms of the variables used in fig. 5, N = n, P = m x n, C = n, and P/C = m. In this arrangement, the output ports of the SCCU are regarded as the collective outputs of the space switching modules identified above, prior to but not including the various elements **54i-j**. It is considered inherent that the Shiragaki SCCU as interpreted above is useable for packet switching and circuit switching applications. Furthermore, the broadcasting of input signals by the broadcast stage (including dividers **51i**) is independent of wavelength since the dividers merely split the power of the signal among their different outputs (i.e. they do not perform any wavelength demultiplexing).

It is noted that the above rejection of Shiragaki was revised to exclude elements **54i-j** from the interpretation of the SCCU. These elements contribute no relevant function to the SCCU because they each have just one input and one output.

Claim 2: There are exactly N dividers **51i** and C modules.

Claim 3: Each of the C space switching modules includes means for connecting each of its N inputs to one of its P/C outputs.

Claim 4: Each of the C space switching modules is a non-blocking switch matrix with N inputs and P/C outputs.

Claim 10: The switching stage uses a technology based on lithium niobate (col. 20 lns. 35-38).

Claim 11: In the fig. 5 arrangement, each of the P/C outputs of the C modules is followed by a wavelength converter **55i-j**, which may be implemented as a semiconductor optical amplifier (col. 20 lns. 60-65).

Claims 1-4 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Doerr et al. (US 6532090).

Claim 1: Doerr discloses in fig. 7 a space cross-connect unit (SCCU) with N input ports and P output ports, comprising: a broadcast stage with N signal dividers **703** each having one input and C outputs where C is an integer factor of P less than P, each input being connected to one of the N input ports **700** so that each divider divides a signal received at one of the input ports into C signals at the C outputs, and a space switching stage comprising at most C space switching modules (two of them are shown as **710** and **711**), the SCCU being characterized in that: the C space switching modules are non-blocking and non-broadcasting (col. 6 lns. 39-40), and each module has N inputs and P/C outputs, said N inputs are connected to N outputs of the broadcast stage, each of those N outputs comes from a different divider **703**, and each of the P/C outputs of the modules is connected to a respective one of the P output ports. In terms of the variables used in fig. 7, $N = k$, $P = k^2$, $C = k$, and $P/C = k$. In this arrangement, the output ports are regarded as the collective outputs of the space switching modules identified above, prior to but not including the combiners **705**. It is considered inherent that the Doerr SCCU as interpreted above is useable for packet switching and circuit switching applications. The

broadcasting of input signals by the broadcast stage (including dividers **703**) is independent of wavelength since the dividers merely split the power of the signal among their different outputs (i.e. they do not perform any wavelength demultiplexing).

Claim 2: There are exactly N dividers **703** and C modules.

Claim 3: Each of the C modules includes means for connecting each of its N inputs to one of its P/C outputs.

Claim 4: Each of the C switching modules is a non-blocking switch matrix with N inputs and P/C outputs.

Claim 11: Each of the P/C outputs of the C modules is followed by an amplifier (which is part of **705** – col. 6 lns. 44-45).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki et al. (applied above).

Claim 12: Shiragaki does not show the input of each divider being preceded by an amplifier. It is considered inherent that the signals coming into the device at ports **50i** were previously conducted along an optical network. For example, fig. 5 is a component corresponding to **101** of fig. 1, and the complete fig. 1 apparatus is a node in an optical network. It would have been obvious to a skilled person to use an amplifier in the optical network upstream of the Shiragaki fig. 5 device since it is well known that optical transmission lines have non-zero attenuation and since it is desirable to compensate for such attenuation in order to maintain the optical signals at useful strengths.

Response to Arguments (July 17, 2006 Amendment)

The remarks argue that neither Shiragaki nor Doerr discloses that their SCCU is configured to be used for packet switching as well as circuit switching, but may only be used in circuit switching (p. 9). This argument is not persuasive because it is an allegation. The remarks do not explain why the references cannot be used in packet switching and do not identify what difference in structure between the reference SCCUs and the claimed SCCU accounts for this supposed shortcoming of the reference SCCUs compared to the claimed SCCU.

The remarks argue that the Shiragaki and Doerr SCCUs are not adapted to provide broadcasting of input signals independently of spectral considerations. "Independently of spectral considerations" means "without using multiplexing or wavelength selection" (specification p. 3 lns. 4-6). This argument is not persuasive because the broadcast stages of both reference SCCUs do broadcast input signals without regard to wavelength. Splitters **51i** in Shiragaki or **703** in Doerr are power splitters, not wavelength splitters. They broadcast their input signals to their respective outputs without any multiplexing or wavelength selection.

It is noted that claim 1 as amended recites "broadcasting of input signals independently of spectral considerations". It appears that the distinction between the invention and the reference SCCUs hinted at in the remarks is that the broadcasting of input signals *to the output ports* of the inventive SCCU is done independently of wavelength. Note the paragraph spanning pp. 2-3 of the specification. In this regard it may be possible to distinguish over Doerr by reciting something in the spirit of "broadcasting of input signals to output ports independently of spectral considerations", since the Doerr SCCU as interpreted above does involve wavelength-selective elements **704** (fig. 7). However it does not appear that this would distinguish over Shiragaki since no wavelength-dependent activity is done by any of the elements **51i**, **52i-j**, or **53i-j** that make up the SCCU of Shiragaki as interpreted in the above rejection.

The remarks also disagreed with the rejections' characterization of output ports. However, it appears that the remarks refer to output ports of the entire system shown in Shiragaki fig. 5 or Doerr fig. 7 respectively. The entire system is not an SCCU. The rejections explained what elements of each system were being interpreted as constituting an SCCU, and

identified the corresponding output ports *of the SCCU.* Accordingly, it is asserted that the characterization of output ports in the rejections was and is proper.

The remarks (p. 9) argue that the Shiragaki and Doerr references do not disclose the claimed "connecting" function of the "means for connecting" in claim 3. This argument is not persuasive since in the reference devices, within each space switching module, each of the N inputs is inherently connected to one of the P/C outputs during operation of the SCCU.

Allowable Subject Matter

Claims 5-9 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if the above informality objection to claims 5-6 is overcome. Allowable aspects of claims 5-9 and 13-14 were noted in the last Office action (mailed April 21, 2006). New claim 15 contains allowable subject matter at least by dependence from claim 6.

Conclusion

Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries about this letter should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official correspondence which is eligible for submission by facsimile and which pertains to this application may be faxed to 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Questions about the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Stahl MJS
Patent Examiner
Art Unit 2874

September 18, 2006

SUNG PAK
PRIMARY EXAMINER